

CLAIMS

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

1. A stage assembly comprising:
 - a first motor that includes a first part and a second part, the first motor producing a first force;
 - a second motor that includes a first part and a second part, the second motor producing a second force;
 - a base to which the first part of the first motor is attached;
 - a stage to which is attached the second part of the first motor and the second part of the second motor, the stage moving relative to the base by at least one of the first force and the second force; and
 - a second stage to which the first part of the second motor is attached; wherein the base and the second stage are different respective bodies.
2. The stage assembly of Claim 1, wherein the first part of the first motor and the second part of the first motor interacts with each other to produce the first force and the first part of the second motor and the second part of the second motor interact with each other to produce the second force.
3. The stage assembly of Claim 1, including (a) two of the first parts of the first motor; (b) two of the first parts of the second motor; or (c) two first parts of the first motor and two first parts of the second motor.
4. The stage assembly of Claim 1, wherein the base and the second stage are isolated from each other.
5. The stage assembly of Claim 4, wherein at least one of the base and the second stage is connected to ground via a reaction frame.

6. The stage assembly of Claim 4, wherein at least one of the base and the stage base is a counter mass.
7. The stage assembly of claim 4, further comprising an actuator connected to the base, the actuator moving the base.
8. The stage assembly of Claim 1, having at least two stages.
9. The stage assembly of claim 1, wherein
one of the first part and the second part of the first motor comprises a magnet member and the other part comprises a coil member; and
one of the first part and the second part of the second motor comprises a magnet member and the other part comprises a coil member.
10. The stage assembly of Claim 9, wherein at least one magnet member of the first motor and the second motor is planar and/or at least one coil member of the first motor and the second motor is planar.
11. The stage assembly of claim 1, wherein the direction of the first force is different from the direction of the second force.
12. The stage assembly of claim 1, further comprising a levitation device that supports a part of weight of the stage.
13. The stage assembly of claim 1, wherein the second stage is movable along the same direction of the first force.
14. The stage assembly of claim 1, wherein at least one of the first motor and the second motor includes a pair of the motors and produces torque about the Z axis that is perpendicular to a guide surface of the base.
15. The stage assembly of claim 1, wherein at least one of the first motor and

the second motor produces a third force, the direction of the third force being perpendicular to a guide surface of the base.

16. The stage assembly of claim 15, wherein at least one of the first motor and the second motor produces torque about the X and Y axes.

17. The stage assembly of claim 15, wherein the stage is movable in six degrees of freedom by the first motor and the second motor.

18. A stage assembly comprising:

a first motor that includes a first part and a second part, the first motor producing a first force;

a second motor that includes a first part and a second part, the second motor producing a second force;

a base to which the first part of the first motor is attached;

a stage to which is attached the second part of the first motor and the second part of the second motor, the stage moving relative to the base by at least one of the first force and the second force; and

the first part of the second motor being attached to a second body that is different from the base.

19. A method for driving a stage, comprising

driving the stage by (a) a first force produced by a first motor including a first part and a second part that interacts with the first part; and (b) a second force produced by a second motor including a first part and a second part that interacts with the first part of the second motor,

with the first part of the first motor and the first part of the second motor being separate,

wherein the first part of the first motor is attached to a base that supports the stage and the first part of the second motor is attached to a different body from the base.

20. The method of claim 19 wherein at least one of the first motor and the

10021053-121901

second motor includes a pair of the motors and produces torque about the Z axis that is perpendicular to a guide surface of the base.

21. The method of claim 19, wherein at least one of the first motor and the second motor produces a third force, the direction of the third force being perpendicular to a guide surface of the base.

22. The method of claim 21 wherein at least one of the first motor and the second motor produces torque about the X and Y axes.

23. The method of claim 19 wherein the stage is movable in six independent degrees of freedom by the first motor and the second motor.

24. An exposure apparatus comprising:

an illumination system that irradiates radiant energy; and

an apparatus comprising:

a first motor that includes a first part and a second part, the first motor producing a first force;

a second motor that includes a first part and a second part, the second motor producing a second force;

a base to which the first part of the first motor is attached;

a stage to which is attached the second part of the first motor and the second part of the second motor, the stage moving relative to the base by at least one of the first force and the second force; and

a second stage to which the first part of the second motor is attached,

wherein the base and the second stage are different respective bodies; the apparatus disposing an object on a path of the radiant energy.

25. A device manufactured with the exposure apparatus of claim 24.

26. A wafer on which an image has been formed by the exposure apparatus of claim 24.